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COMPARISON OF PUREBRED AND GRADE DAIRY COWS

By J. C. McDowell, *Dairy Husbandman, Bureau of Dairy Industry*

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FROM SCRUBS TO GRADES

The earliest cows produced only enough milk to feed their calves until the calves could forage for themselves. After cows became domesticated their milk production became much higher because they were selected to some extent and were better fed. Rapid progress, however, did not take place until the development of the purebred dairy cattle of modern times.

Nearly all the dairy-herd improvement resulting from breeding is due to the purebred dairy sire. Through the use of such a sire, the scrub herd is transformed, in one generation, into a herd of grades. Through the further use of a good purebred dairy sire, the grade herd is soon built up into a herd of high grades. Many of the herds on test in dairy-herd-improvement associations have been so improved through the continued use of purebred dairy sires that only a mere trace of the blood of the old scrubs remains. It is, therefore, not at all surprising that in many cases these high-grade herds approach, after a time, the high production level of the purebreds.

It would be interesting to compare the production records of the old scrub herds with the production records of the grade and purebred herds of to-day. Records of few scrub herds were kept, however, and, almost without exception, the small number of scrub cows that still remain in the herds on test are the very best of the original herd. Therefore, a fair comparison of scrubs with grades and purebreds can not be made.

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REASONS FOR MAKING THE STUDY

The statement is sometimes made that grade dairy cows produce as much milk and butterfat per cow as purebreds. Even when it is admitted that purebred dairy cows produce more than grades, it is sometimes claimed that the grades produce more economically. As a rule such conclusions have been based either on general observations or on a comparatively small number of records.

To obtain more definite information on this subject the Bureau of Dairy Industry made a study of over 100,000 yearly individual records of purebred and grade cows in dairy-herd-improvement associations. The records were from all parts of the United States where these associations are in operation. (Fig. 1.) All dairy sections, therefore, were fairly represented, and the large number of records studied make the results fairly conclusive.

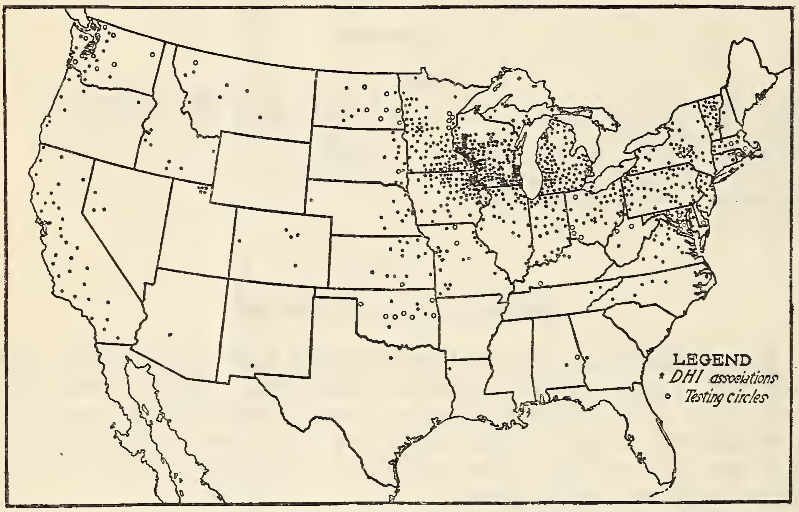

FIG. 1.—Location of dairy-herd-improvement associations in the United States as of January 1, 1927. There were 837 associations and 52 testing circles

BASIS OF CLASSIFICATION

This study includes the purebreds and grades of four breeds of dairy cattle. No attempt was made to verify the classification "purebred" and "grade" made by the testers, that is, by those who weighed and tested the milk and kept the feed records, but their classification was accepted as the basis on which to sort the records. As a rule, testers classify cows as purebreds when the cows are registered or eligible to registry, and they classify them as grades when they have enough purebred ancestry of any particular breed to give them the appearance of that breed.

Only those records were used that clearly stated the breed of the cow, her age, and the fact that she was on test an entire year. The feed records were computed for 12 months, and the production records included all the milk and butterfat the cow produced within that period. As shown in Table 1 and Figure 2, this study compared

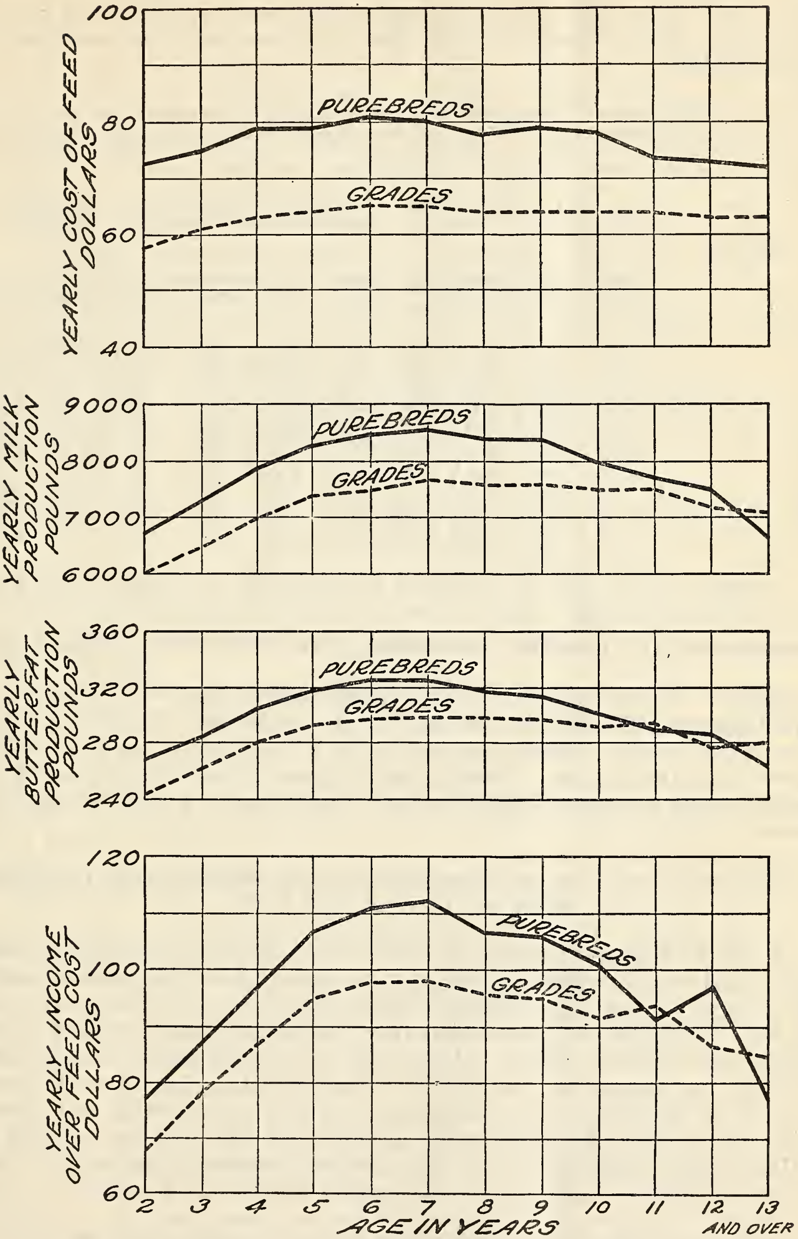

FIG. 2.—Comparison of purebreds and grades at various ages on the basis of cost of feed, production of milk and butterfat, and income over cost of feed per cow. The records of 29,397 purebred and of 71,745 grade cows are used in the comparisons

the cows on the basis of cost of feed, production of milk and butterfat, and income over cost of feed per cow. These comparisons were made with groups of cows varying in age from 2 years to 13 years and over. Cost of labor and overhead expenses were not taken into consideration.

TABLE 1.—*Comparison of purebreds and grades on the basis of cost of feed, milk and butterfat production, and income over cost of feed per cow for one year*

Age, years	Cows in group		Cost of feed per cow		Milk production per cow		Butterfat production per cow		Income over cost of feed per cow	
	Purebreds	Grades	Purebreds	Grades	Purebreds	Grades	Purebreds	Grades	Purebreds	Grades
	No.	*No.*	*Dolls.*	*Dolls.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Dolls.*	*Dolls.*
2	3, 841	7, 797	72. 55	58. 23	6, 840	5, 969	270	244	77. 45	68. 11
3	5, 511	10, 628	75. 12	60. 62	7, 306	6, 500	285	263	87. 14	77. 78
4	5, 101	9, 930	78. 82	63. 02	7, 944	7, 047	305	282	97. 46	87. 46
5	4, 081	9, 561	79. 23	63. 81	8, 332	7, 383	319	294	107. 08	95. 39
6	3, 361	9, 302	81. 41	64. 83	8, 516	7, 543	325	298	111. 21	98. 16
7	2, 510	8, 124	80. 33	65. 38	8, 582	7, 607	325	299	111. 67	98. 27
8	1, 831	6, 594	77. 93	64. 19	8, 375	7, 570	317	298	107. 00	96. 45
9	1, 217	4, 033	79. 11	64. 32	8, 378	7, 576	314	297	106. 45	95. 21
10	821	2, 746	78. 05	63. 96	8, 014	7, 456	301	292	101. 34	91. 81
11	471	1, 312	73. 63	64. 06	7, 706	7, 466	291	295	91. 65	94. 50
12	325	955	72. 54	62. 65	7, 529	7, 151	285	279	96. 52	87. 30
13 and over	327	763	72. 17	63. 17	6, 712	7, 099	261	280	78. 43	85. 45
Total	29, 397	71, 745								
Average			77. 50	62. 98	7, 878	7, 124	303	284	97. 79	89. 13

PUREBREDS AND GRADES COMPARED AS TO COST OF FEED PER COW

Table 1 shows that the average yearly cost of feed[1] for purebreds of all ages was $77.50 per cow, and for grades $62.98. The purebreds, therefore, on the average ate $14.52, or 23 per cent, worth of feed more than the grades. Table 1 and Figure 2 both show also that mature cows ate more dollars' worth of feed per cow than immature cows.

PUREBREDS AND GRADES COMPARED AS TO PRODUCTION OF MILK AND BUTTERFAT PER COW

A point of special interest in Table 1 and Figure 2 is the fact that the purebreds produced slightly more milk than the grades until the age of 13 years and slightly more butterfat until the age of 11 years. Doubtless the reason that they did not continue to excel after these ages was the closer culling out of low producers among the grades than among the purebreds. Purebreds that have passed their period of usefulness as producers of milk and butterfat are often kept in the herd for their value as breeders. This seems to offer a satisfactory explanation for the gradual coming together of the curves in Figure 2 after the cows passed the age of 9 years.

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[1] In dairy-herd-improvement-association work feed cost is figured on the farm value of feed. If the feed is grown on the dairy farm, its value is computed at what that feed is worth on the farm. Purchased feed is figured at what it costs to buy it and haul it to the farm. Such feeds as silage and corn stover are figured at their equivalents in other feeds, or in some cases a uniform price is used for all the herds in the association. Pastures are usually figured at their rental value.

Table 1 shows that the average yearly milk production for purebreds of all ages was 7,878 pounds per cow and for grades 7,124 pounds. The purebreds therefore produced, on the average, 754 pounds, or 10.6 per cent, more milk than the grades. This table also shows that the average yearly butterfat production for purebreds of all ages was 303 pounds per cow and for grades 284 pounds. The purebreds therefore produced, on the average, 19 pounds, or 6.7 per cent, more butterfat than the grades. According to Table 1 and Figure 2 the purebreds were fed more liberally than the grades. Whether the purebreds produced more than the grades because of better feeding or whether they were fed more liberally because they were higher producers is difficult to determine. Since it is customary in dairy-herd-improvement associations to feed grain according to known production, it is probable that a large percentage of these cows were better fed when it was found that better feeding resulted in increased production.

Although the production of the same cows is not shown over a period of years, a comparison of a large number of different cows shows that the highest production is between 5 and 9 years of age with the peak at about the age of 7.

PUREBREDS AND GRADES COMPARED AS TO YEARLY INCOME OVER COST OF FEED PER COW

High production of milk and butterfat is important only when accompanied by high income over cost of feed. From the standpoint of the dairy farmer this is the most important factor in connection with his herd.

In spite of the fact that the cost of feed for purebreds is greater than that for grades, Table 1 and Figure 2 show that the income over cost of feed per cow was higher for purebreds than for grades until the cows reached the age of 11 years.

The table shows that purebreds of all ages return, on the average, $97.79 per cow per year over cost of feed; whereas grades return only $89.13. The purebreds, therefore, yield an annual net income of $8.66, or 9.7 per cent, more than the grades.

Many dairymen do not consider a herd very profitable until the income over cost of feed exceeds an average of $100 a year per cow for all mature cows. In the table the purebreds from 5 to 10 years of age are the only cows that come up to this standard. That it is not an impossible standard is shown by hundreds of herd summaries of both grade and purebred herds in dairy-herd-improvement associations. Some of these herds have an average yearly butterfat production of 300 pounds per year per cow for all ages combined; a return of more than $100 income over cost of feed per year per cow; and a return of $2.50 to $3 for every dollar spent for feed. Of these three factors the most important to the dairyman is the return of more than $100 a year per cow in income over cost of feed.

Usually high production is accompanied by the other two factors, but this is not always the case. Sometimes when low cost of feed per cow results in a large return for $1 spent for feed, it results also in a low yearly income over cost of feed. In one dairy-herd improvement association the feed cost for one herd of cows was only about $15 per cow for one year, and the gross returns approximated $60 per cow. Although this herd returned about $4 for every dollar spent for feed, the income over cost of feed per cow per year was only $45. In the same association during the same year another herd was fed $100 worth of feed per cow and returned $200 per cow in gross income. This herd returned only $2 for every dollar spent for feed, but it returned $100 in income over cost of feed per cow, which was more than twice the income over cost of feed per cow that was returned by the other herd.

SUMMARY

In this study a comparison was made of the records of 29,397 purebreds and 71,745 grades of four breeds. In each tabulation purebreds and grades of the same age were compared.

On an average in one year the purebreds of all ages ate $14.52, or 23 per cent, worth of feed more per cow than the grades. They produced 754 pounds, or 10.6 per cent, more milk per cow per year than the grades. In yearly butterfat production per cow they excelled the grades by 19 pounds, or 6.7 per cent. In yearly income over cost of feed per cow the purebreds of all ages excelled the grades by $8.66, or 9.7 per cent.

The purebreds, on the average, excelled the grades in production of milk until the age of 13 years, in production of butterfat until the age of 11 years, and in income over cost of feed per cow until the age of 11 years. After these ages the grades slightly excelled the purebreds. This was due doubtless to the closer culling of the grades.

CONCLUSIONS

The figures given in this circular show that the purebreds on test in dairy-herd-improvement associations excelled the grades in production of milk and butterfat and in income over cost of feed by only a small margin. This may be due in part to the fact that many high-producing purebred dairy herds were not on test in these associations because they were being tested for advanced registry. It may be due also in part to closer culling of the grades as is suggested in the summary. But the outstanding reason is that the high production of both grades and purebreds has been obtained in large part from the same source, namely, the constant use of carefully selected purebred dairy sires.

Since grade cows are better than scrubs, no farmer should waste his time on scrubs. Since high grades are better than low grades, no farmer should be satisfied to stop with low grades. Since purebreds are better than grades, why should not the dairy farmer eventually own a purebred dairy herd? Since all available records show that high-producing purebreds are the most profitable dairy cows, why should not every dairyman set as his final goal the ownership of a well-bred, well-fed, carefully selected herd of purebred dairy cattle?

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